

- Project:** On-Call Transit and Rail Services Project
- Agency:** San Bernardino County Transit Authority
- Client:** Mott MacDonald Group, Inc.
- Soteria's Role:** System Safety Security and Certification of the ZEMU Project elements
- Completion:** Scheduled for 2029

Project Overview

SBCTA is playing a leading role in piloting zero emission rail and making transportation and transit modes as efficient, economical, and environmentally responsible as possible. Diesel Multiple Units (DMU) are currently in operation on SBCTA's nine-mile Arrow corridor between Redlands and San Bernardino, and SBCTA is in the process of converting the DMU fleet to Zero-Emission Multiple Unit (ZEMU). The ZEMU rail vehicle will use a hybrid hydrogen fuel cell and battery technology to propel the vehicle, providing a cleaner transit option for the community.



Zero-emission Multiple Unit (ZEMU). Photo courtesy SBCTA

A contract signing in 2019 between Stadler US and SBCTA cleared the path to manufacture the first two-car hydrogen-powered passenger train to operate in the United States. To support the operations of the ZEMU vehicle, specific upgrades and modifications are required to the existing Arrow Maintenance Facility to facilitate hydrogen storage, refueling, and required safety enhancements.

Soteria's Contribution to This Project

Soteria is providing support and expertise to Mott MacDonald, including System Safety and Security Planning, Analysis and Certification.

Details of Soteria's Support of ZEMU Safety Efforts

1. Safety and Security Certification Program Plan (SSCPP)
 - Update the current Redlands SSCPP to support ZEMU project
 - Identify the ZEMU Certifiable Elements and Sub-Elements
 - Coordinate the review, comment, and approval process
2. Operating Hazard Analysis (OHA)
 - Prepare for and facilitate the OHA workshop meetings
 - Expand the existing Redlands OHA reports and worksheet to address any additional hazards related to the ZEMU project
 - Verify the OHA worksheet for design, construction, and operational readiness

3. Design and Construction Checklists
 - Initiate, schedule, and facilitate the Safety and Security Certification Committee (SSCC) Meetings
 - Coordinate with the design team and contractor to verify both checklists
 - Facilitate the audit process for the checklists for final certification
 - Finalize both packages with the signed Certificate of Conformance (CoC)
4. Safety and Security Certification Verification Report (SSCVR)
 - Update the current Redlands SSCVR to support the ZEMU project
 - Initiate, schedule, and facilitate the Fire/Life Safety and Security Committee (FLSSC) Meetings
 - Provide Master List of Open Items and Exceptions
 - Provide the final design and construction checklist packages
 - Provide the final OHA
 - Review, track, and provide status of the acceptance and System Integration Testing
 - Review, track, and provide status of the Construction Contractor-Provided Training
 - Review, track, and provide status of the Operations and Maintenance (O&M) Manuals
 - Review, track, and provide status of the Emergency Response Training and Exercises
 - Facilitate the handover of the Operational Readiness Certification by Metrolink
 - Coordinate all the Final CoCs and Certificates of System Safety and Security